flat pack occupies an area about four to ten times greater than that of the IC chip, and this has been a factor of hindering the miniaturization.

In contrast to this, the flip chip method for mounting an IC chip in a bear chip style directly on a board for the reduction of process and the reduction in size and weight has come to be adopted lately. With regard to this flip chip method, there are developed many processing methods such as stud bump bonding (SBB) for performing bump formation on an IC chip, bump leveling, Ag·Pd paste transfer, mounting, inspection, encapsulation with encapsulation resin, and inspection and UV resin bonding for concurrently performing bump formation on an IC chip and UV-curing resin coating on a board and thereafter performing mounting, UV-curing of resin and inspection.

However, any of the processing methods has had the drawback that much time is required for the hardening of the paste for bonding the bumps of the IC chip to the electrodes of the board and for the coating and hardening of the encapsulation resin, leading to degraded productivity. There has also been the issue that ceramic or glass of which the quantity of warp is controlled is needed as a circuit board, leading to cost increase.

Moreover, according to the processing method that uses a conductivity paste as in the first prior art for the

bonding material, it has been required to level and flatten the IC chip bumps before use in order to stabilize the quantity of transfer.

Moreover, in the bonding structure with an anisotropic conducting adhesive as in the second prior art, there has been developed one that employs glass as a board material of the circuit board. It is required to hold conductive particles between the IC chip side electrode and the board side electrode for electric continuity between the electrodes, and therefore, it is required to uniformly disperse the conductive particles in the conductive adhesive. However, it is difficult to uniformly disperse the conductive particles in the conductive adhesive, and this has disadvantageously caused short circuit due to the abnormal dispersion of the particles and led to the expensive cost of the conductive adhesive and the necessity of the formation of the IC chip bumps by electroplating in order to shape the height of the bumps.

Moreover, according to the method of performing bonding using a UV-curing resin as in the third prior art, it is required to set a bump height variation within a range of ±1 (μm), and there has been the issue that the bonding cannot be achieved in the case of a board of a degraded flatness such as a resin board (glass epoxy board). Moreover, according to the method using solder, it has been

required to pour and harden the encapsulation resin in order to alleviate the thermal expansion and shrinkage difference between the board and the IC chip after bonding. A time of two to eight hours has been needed for the hardening of the encapsulation resin, and this has led to the issue that the productivity is extremely degraded.

Accordingly, the object of the present invention is to solve the aforementioned issues and provide an electronic component mounting method and apparatus for bonding electronic components to circuit boards with high productivity and high reliability by interposing an anisotropic conductive layer that has conductive particles needing neither a resin encapsulation process for pouring a resin between an electronic component and a board nor a bump leveling process for shaping the bump height after the electronic component is bonded to the circuit board as well as an electronic component unit obtained by mounting the electronic component on the board by the above-mentioned mounting method.

Disclosure Of Invention

In accomplishing these and other aspects, the present invention is constructed as follows.

According to a first aspect of the present invention, there is provided an electronic component mounting method comprising: